

PROCEEDINGS OF SPIE

***UV, X-Ray, and Gamma-Ray
Space Instrumentation for
Astronomy XXII***

Oswald H. Siegmund

Editor

1–5 August 2021

San Diego, California, United States

*Sponsored and Published by
SPIE*

Volume 11821

Proceedings of SPIE 0277-786X, V. 11821

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXII*, edited by Oswald H. Siegmund, Proc. of SPIE 11821, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510644809

ISBN: 9781510644816 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2021 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

SPACEBORNE EXPERIMENTS AND MISSIONS

- 11821 03 **The ESCAPE mission overview: exploring the stellar drivers of exoplanet habitability** [11821-1]
- 11821 04 **Opto-mechanical design of the ESCAPE Small Explorer: an EUV spectrograph for exoplanet host star irradiance and CME activity** [11821-2]
- 11821 05 **GAGG Radiation Instrumentation (GARI)** [11821-55]
- 11821 06 **The Spectroscopic Ultraviolet Multi-object Observatory (SUMO) mission concept** [11821-3]
- 11821 07 **Development for a metrology system for the Arcus MIDEX mission** [11821-4]
- 11821 08 **NExtUP: the Normal-incidence Extreme Ultraviolet Photometer** [11821-5]
- 11821 09 **The Gamow Explorer: a Gamma-Ray Burst Observatory to study the high redshift universe and enable multi-messenger astrophysics** [11821-59]

MICROCHANNEL PLATE DETECTORS

- 11821 0A **TRL6 testing of a curved borosilicate glass microchannel plate far-UV detector assembly for spaceflight** [11821-10]
- 11821 0B **Development of sealed cross strip readout UV detectors** [11821-60]
- 11821 0C **Large format atomic layer deposited microchannel plates for photon counting image sensors** [11821-56]

SUB ORBITAL AND CUBESAT INSTRUMENTS I

- 11821 0E **Mechanical design and development of SPRITE: a 12U CubeSat with a far-ultraviolet imaging spectrograph** [11821-6]
- 11821 0F **INFUSE: assembly and alignment of a rocket-borne FUV integral field spectrograph** [11821-7]
- 11821 0G **Progress on the design, implementation, and experimental evaluation of the electronics for the SPRITE CubeSat** [11821-9]
- 11821 0H **The assembly, calibration, and predicted performance of the SISTINE-2 sounding rocket payload** [11821-8]

SUB ORBITAL AND CUBESAT INSTRUMENTS II

- 11821 OI **The Mini Astrophysical MeV Background Observatory (MAMBO) CubeSat mission** [11821-19]
- 11821 OK **An update on the rockets for extended-source X-ray spectroscopy** [11821-17]
- 11821 OL **FOXSI-4: the high resolution focusing X-ray rocket payload to observe a solar flare** [11821-18]

POLARIMETRY MISSIONS AND INSTRUMENTS

- 11821 OM **The Imaging X-Ray Polarimetry Explorer (IXPE): technical overview IV** [11821-32]
- 11821 OP **The Large Area burst Polarimeter (LEAP) a NASA mission of opportunity for the ISS** [11821-35]
- 11821 OQ **Evaluation of a prototype detector for the Large Area burst Polarimeter (LEAP)** [11821-36]

SOLID STATE DETECTORS

- 11821 OT **Measuring the quantum efficiency of X-ray hybrid CMOS detectors** [11821-25]
- 11821 OU **Design of the ULTRASAT UV camera** [11821-21]
- 11821 OV **Developments of the focal plane camera for tREXS** [11821-26]
- 11821 OW **Principal component analysis of the Chandra ACIS gain** [11821-27]

OPTICAL COMPONENTS FOR UV AND X-RAY INSTRUMENTS I

- 11821 OX **Performance of anisotropically-etched gratings in the extreme and far ultraviolet bandpasses** [11821-12]
- 11821 OY **Generating electron beam lithography write parameters from the FORTIS holographic grating solution** [11821-13]

OPTICAL COMPONENTS FOR UV AND X-RAY INSTRUMENTS II

- 11821 IO **Lyman-alpha filter prototype to enable astronomical photometry in the Lyman ultraviolet** [11821-15]

- 11821 12 **Fabrication of custom astronomical gratings for the extreme and far ultraviolet bandpasses**
[11821-28]
- 11821 13 **Source-specific perforated attenuators for use with pixelated spectroscopic x-ray detectors**
[11821-29]
- 11821 14 **Metal coated high aspect ratio glass capillary arrays for X-Ray collimation** [11821-31]

POSTER SESSION

- 11821 15 **Improving HEXITEC gain calibration through charge-shared and fluorescent multi-pixel events**
[11821-37]
- 11821 16 **Thermal performance and design of the SPRITE far-UV CubeSat** [11821-39]
- 11821 17 **Development and characterization of the CCD detector for the Colorado Ultraviolet Transit Experiment (CUTE) cubesat** [11821-43]
- 11821 1A **Advances in detector-integrated filter coatings for the far ultraviolet** [11821-50]
- 11821 1B **New far-ultraviolet reflectivity measurements from ALD-deposited mirror coatings**
[11821-38]
- 11821 1D **Development of a Compton telescope based on single-crystal diamond detectors and fast scintillators** [11821-42]
- 11821 1E **Development of a 12m coilable boom for the Arcus MIDEX mission.** [11821-45]
- 11821 1G **Radiation testing of a back illuminated, small pixel, CMOS compatible CCD** [11821-47]
- 11821 1H **Extending the life of the Cosmic Origins Spectrograph (COS) with new lifetime positions**
[11821-49]